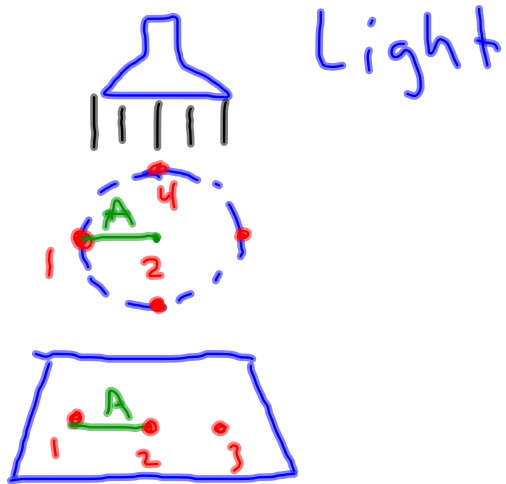


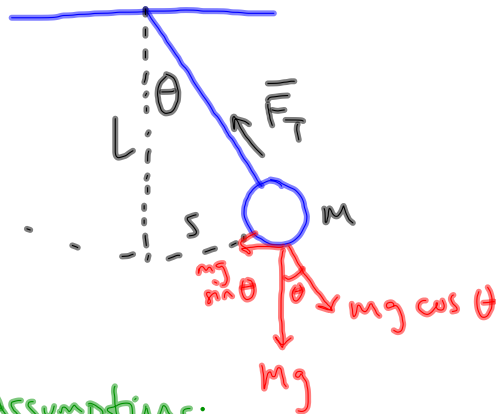
SHM compared to Circular Motion:



— obj. in circular motion projected onto a screen looks like an obj. in SHM

— use same SHM eqns. to describe object's motion around circle

Pendulum:



Assumptions:

- String's mass is much less than mass of the bob
- Small angle approximation:

$$\sin \theta \approx \theta \quad (\text{when } \theta \text{ measured in radians})$$

$$\sum \vec{F}_x = m a_x$$

$$s = L\theta$$

$$F_{Tx} = -\cancel{mg} \sin \theta = \cancel{m} \underbrace{\frac{d^2 s}{dt^2}}_{m a_x}$$

$$\frac{d^2 \theta}{dt^2} = -\frac{g}{L} \sin \theta$$

$$\frac{d^2 \theta}{dt^2} = -\frac{g}{L} \theta \quad \omega^2 = \frac{g}{L}$$

$$T = 2\pi \sqrt{\frac{L}{g}}$$